

**Clinical summary**

# Epidemiology and characteristics of acute poisoning treated at an emergency center

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**BACKGROUND:** Acute poisoning is frequently encountered at emergency department. This study was to investigate the epidemiology and characteristics of patients with acute poisoning who were treated at the Emergency Center, Fujian Provincial Hospital, China.

**METHODS:** We retrospectively analyzed the gender, age, causes of poisoning, types of poisons, poisoning route, emergency diagnoses, outcomes, and prognoses of these patients.

**RESULTS:** Altogether 2867 patients with acute poisoning were treated from January 2004 to December 2009. The ratio of male to female was 1:1.04, and their average age was 33.8 years. Of the 2867 patients, 76.39% were between 18 and 40 years old. The incidence of acute poisoning was as high as 11.33% in January each year. The incidence of poisoning was in a descending order: alcohol poisoning (54.55%), medication poisoning (25.95%), pesticide poisoning (5.65%), and drug poisoning (4.88%). Most (56.44%) of the patients with drug poisoning were under 25 years and their mean age was significantly lower than that of patients with medication poisoning or alcohol poisoning ( $P < 0.01$ ). Approximately 69.54% of the patients were followed up after emergency treatment, 30.39% were hospitalized, and four patients died.

**CONCLUSIONS:** Acute poisoning is largely alcohol poisoning and medication poisoning in a city. The emergency green channel "pre-hospital emergency care-emergency department-hospital treatment" can significantly improve the survival rate of patients with acute poisoning.

**KEY WORDS:** Hospital-affiliated emergency center; Management model; Green channel; Acute poisoning; Epidemiology, emergency care

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## INTRODUCTION

The incidence of acute poisoning has been increasing in Fuzhou area in recent years. To evaluate the epidemiology and characteristics of acute poisoning, we retrospectively analyzed the data of 2867 patients with this poisoning who had been treated at the Emergency Center, Fujian Provincial Hospital, China from January 2004 to December 2009.

The data including gender, age, causes of poisoning, types of poisons, poisoning route, emergency diagnoses, outcomes, and prognoses of the patients were input into a Microsoft Excel database for statistical analysis.

Of the 2867 patients 1408 were male and 1459

female, with a male to female ratio of 1:1.04. Their age ranged from 14 to 93 years (mean 33.8 years). Patients of 18 to 40 years old accounted for 76.39% (Figure 1).

In 1564 patients (54.55%) with alcohol poisoning, 1025 (65.54%) were male, whereas in 744 patients (25.95%) with medication poisoning, 600 (80.65%) were female. Patients with pesticide poisoning and drug poisoning accounted for 5.65% and 4.88% respectively. In patients with drug poisoning, however, males were more than females. There were other types of poisoning, like chemical poisoning, food poisoning, rodenticide poisoning, carbon monoxide poisoning, and phosgene poisoning (Table 1).

There was no significant difference in season distribution. In month distribution, January showed the highest incidence (11.33%), whereas March had the lowest (6.35%). In the two most common types of poisoning, alcohol poisoning occurred frequently in January, and medication poisoning in May (Figure 2).

In the patients with alcohol poisoning, males accounted for 65.54%, while in the medication poisoning, females accounted for 80.65%. The mean age of alcohol poisoning patients was 32.0 years, and the patients aged  $\leq 25$  years accounted for 32.74%. In

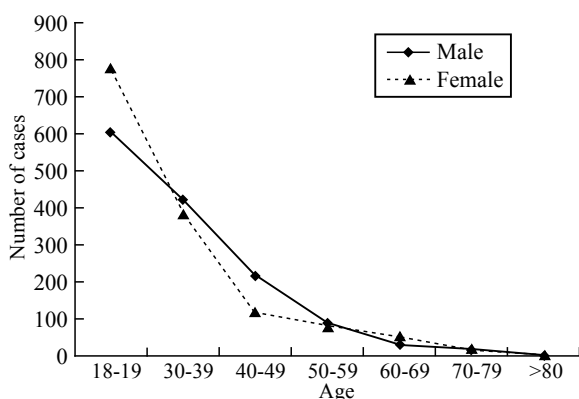
the patients with medication poisoning aged on average 33.0 years, 96.10% were given tranquilizers and in the patients aged  $\leq 25$  years, 40.86% were given the same agents. The average age of the patients with drug poisoning was 28.2 years, which was significantly lower than that of the patients with alcohol poisoning or those with medication poisoning ( $P < 0.01$ ).

The gastrointestinal tract and respiratory tract were the routes for poisons entering the body. Oral administration and inhalation accounted for 95.44% and 4.35% respectively. Among the patients, 438 (15.28%) were subjected to emesis treatment, 251 (8.75%) to gastric lavage, 735 (25.64%) to diuresis, 1493 (52.08%) to specific medications, and 94.33% to transfusion. Five patients underwent endotracheal intubation because of breathing difficulty caused by pesticide poisoning. One patient underwent tracheotomy.

The severity of the poisoning was classified into mild, moderate, or severe according to the conditions of patients on admission. Altogether 28.94% of the patients suffered from mild poisoning, 58.22% from moderate poisoning, and 12.84% from severe poisoning. A total of 871 patients were hospitalized, but 163 of them were discharged home without treatment. In fact 1994 patients (69.55%) were followed up after emergency care. Four patients with pesticide poisoning died.

**Table 1.** Types of acute poisoning and number and percentage of cases

Type of poisoning	Number of cases	Percentage (%)
Alcohol	1564	54.55
Medication	744	25.95
Pesticide	162	5.65
Drug	140	4.88
Chemical	81	2.83
Food	60	2.09
Rodenticide	54	1.88
Carbon monoxide	53	1.85
Phosgene	7	0.24
Unknown	2	0.07
Total	2867	100

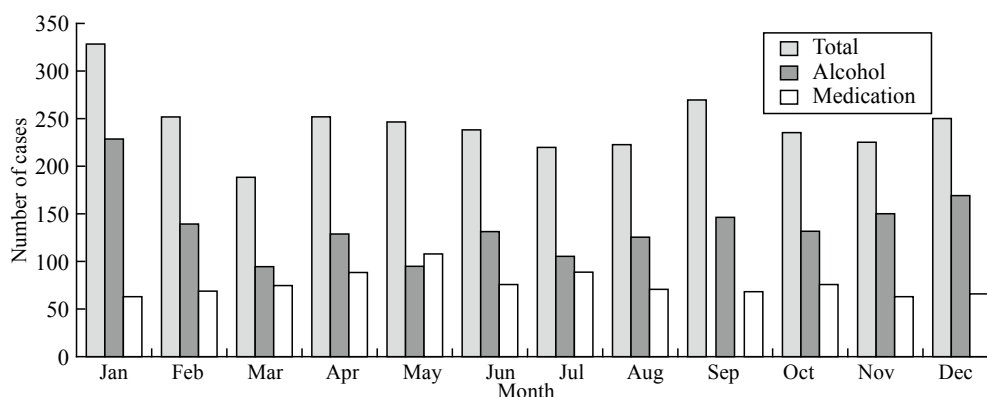


**Figure 1.** Age and gender distribution of patients with acute poisoning.

## DISCUSSION

The incidence of acute poisoning has been increasing in recent years in China. In the present study we investigated the epidemiology and characteristics of patients with acute poisoning who had been treated at the Emergency Center, Fujian Provincial Hospital.

Female patients with acute poisoning were more than male patients in this study, and female patients of 18-



**Figure 2.** The number of poisoning cases and types of poisonings in each month (alcohol and medication poisoning).

40 years old accounted for 76.39%, which was similar to that reported by Ruan et al.<sup>[1]</sup> The likely explanation was that people at this age stage often face with pressures of unemployment, working, love and marriage, and family conflict. Moreover, acute poisoning is the third leading cause of unexpected hospitalization of pregnant women.<sup>[2]</sup> It is proposed that sentiment volatility is also a reason for female patients, such as acute poisoning caused by suicide attempts.<sup>[3,4]</sup>

In this study alcohol poisoning is predominant. Alcohol abuse is still recognized as a common phenomenon in modern society, and the age of patients with alcohol poisoning is younger. In this study, the patients with alcohol poisoning aged  $\leq 25$  years accounted for 32.74%. Hence it is crucial to strengthen public education on healthy lifestyles. In addition, alcohol poisoning occurs frequently in January, which may be connected with family union during the Chinese New Year. Medication poisoning we investigated is at the second position, and it is usually caused by tranquilizers.<sup>[5,6]</sup> In recent years, the proliferation of drugs is fairly brisk, and the drug abuse among young people is increasing. In the present study, drug poisoning was listed in the fourth position, and the mean age of patients was 28.2 years, which was significantly lower than that of patients with alcohol poisoning or medication poisoning. Therefore it is necessary to educate young people to keep away from drugs.<sup>[7]</sup> Since emergency centers vary geographically, many patients with pesticide poisoning from rural areas are usually transferred to the centers, thus leading to a delayed treatment. In our opinion, treatment of acute poisoning should follow the principle of on spot treatment. Pesticides or herbicides poisoning is still the leading cause of death in some areas of China. Therefore it is crucial to strengthen training of medical staff working at county-level hospitals and rural health clinics.

At the emergency center of the Fujian Provincial Hospital we treated timely the 2867 patients with acute

poisoning but 4 patients died from the severity of the condition. The results show that emergency green channel plays an important role in improving the quality of acute poisoning treatment.<sup>[8]</sup>

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